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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,422	06/02/2005	Serge Tretjak	FR-AM 1905	3179

31684 7590 09/11/2008

ARKEMA INC.
PATENT DEPARTMENT - 26TH FLOOR
2000 MARKET STREET
PHILADELPHIA, PA 19103-3222

EXAMINER	
OH, TAYLOR V	

ART UNIT	PAPER NUMBER
1625	

MAIL DATE	DELIVERY MODE
09/11/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/537,422	TRETJAK ET AL.	
	Examiner	Art Unit	
	Taylor Victor Oh	1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/26/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/26/08 has been entered.

The Status of Claims:

Claims 1-7 are pending.

Claims 1-7 are rejected.

DETAILED ACTION

1. Claims 1-7 are under consideration in this Office Action.

Priority

2. It is noted that this application is a 371 of PCT/FR03/03598 (12/05/2003), which has a foreign priority document, France 02/15348 (12/05/2002).

Drawings

3. The drawing filed on 6/02/2005 is accepted by the examiner.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weisberg et al (US 2,465,772) in view of Aslam Mohammad (Kirk-Othermer Encyclopedia of Chemical Technology, 2000, p. 471-496) .

Weisberg et al discloses the preparation of alkyl lactates in the followings:

In accordance with the present invention an aliphatic alcohol, for example, methyl, ethyl or propyl alcohol is reacted with substantially water-free lactic acid (less than 25% water) in the

(see col. 1 ,lines 47-51)

presence of a strong mineral acid under conditions of temperature such that esterification proceeds to completion substantially instantaneously and the ester and other volatiles are flash distilled from any solids present or formed during the reaction.

In order to obtain a substantially quantitative yield of the ester, it has been found desirable to have a relatively large excess of the alcohol present during the reaction, for example, about three to twenty parts of alcohol to one part of lactic acid (calculated on a 100% basis) by weight so that the mass reaction effect is such as to force the reaction in the proper direction. More-

(see col. 2 ,lines 1-14)

During the mixing operation the mixture may be preheated either continuously or in batches, to below the boiling point of the ester, and at about or slightly below the boiling point of the alcohol, for example, to about 150° F. when producing methyl lactate to conserve heat demand in the flash chamber.

The preheated mixture is then fed continuously into a flash chamber heated to above the boiling point of the mixed vapors of ester, alcohol and water. Upon entry into the chamber, the mixture reacts almost instantaneously and flashes into a vapor containing the ester, excess alcohol and water.

The volatile components may be condensed and then further treated in order to separate the alcohol and the water from the ester. The alcohol may be removed readily by distillation or fractionation inasmuch as the boiling points of the alcohol, water and ester are sufficiently far apart that a substantially clean separation may be obtained.

(see col. 2 ,lines 22-43)

The instant invention, however, differs from the prior art in that the degree of conversion for lactic acid is from 80 % ; the flash separation is carried out at a temperature of 152 to 165 ^{0} C.

Aslam Mohammad discloses the following facts about the esterification (see pages 474-475).

2.3. Equilibrium Constants. The reaction between an organic acid and an alcohol to produce an ester and water is expressed in equation 4:

$$RCOH + R'OH \rightleftharpoons RCOR' + H_2O \quad (4)$$

This was first demonstrated in 1862 by Berthelot and Saint-Gilles (32), who found that when equivalent quantities of ethyl alcohol and acetic acid were allowed to react, the esterification stopped when two-thirds of the acid had reacted. Similarly, when equal molar proportions of ethyl acetate and water were heated together, hydrolysis of the ester stopped when about one-third of the ester was hydrolyzed. By varying the molar ratios of alcohol to acid, yields of ester >66% were obtained by displacement of the equilibrium. The results of these tests were in accordance with the mass action law shown in equation 5.

$$K = [ester][water]/[acid][alcohol] \quad (5)$$

2.4. Completion of Esterification. Because the esterification of an alcohol and an organic acid involves a reversible equilibrium, these reactions usually do not go to completion. Conversions approaching 100% can often be achieved by removing one of the products formed, either the ester or the water, provided the esterification reaction is equilibrium limited and not rate limited. A variety of distillation methods can be applied to afford ester and water product removal from the esterification reaction (see DISTILLATION). Other

Regarding the temperature difference of the flash separation, the prior art is silent. However, the flash separation can be easily estimated from the following passages as shown below (see col . 3 , lines 44-49):

> 0.7 and 1.4. The mixture may be heated during its passage through the mixing chamber 14, if desired, and then may be delivered continuously into a flash esterifier 15 which is maintained at a temperature well above the boiling point of the mixed vapors of the ester, alcohol and water. As

From these, it becomes clear that the temperature of the flash separation can be higher than 100 to 154^0 C since the B. P. of the ethyl lactate is 154^0 C. Thus, the claimed range and the prior art range are overlapped each other . Therefor, it would have been obvious to the skilled artisan in the art to be motivated to find the claimed temperature by routine experimentation in the absence of an unexpected result.

Concerning the degree of conversion for lactic acid from 65 to 75 % , Aslam Mohammad does offer guidance that conversions regarding the acid approaching 100 % can be achieved by removing one of the products, the ester or water (see page 475, section 2.4). Therefore, it would have been obvious to the skilled artisan in the art to be motivated to maximize the degree of conversion of lactic acid by removing one of the products, the ester or water so as to enhance the yield of the desired ethyl lactate.

Weisberg et al expressly the process of alkyl lactates by reacting lactatic acid, ethanol and acid catalyst using the flash separator in conjunction with the fractionating distillation column; similarly, Aslam Mohammad does offer guidance for maximizing the

yield during the esterification process with the fact that conversions regarding the acid approaching 100 % can be achieved by removing one of the products, the ester or water. Therefore, it would have been obvious to the skilled artisan in the art to be motivated to incorporate the teaching of Aslam's high degree of conversion method for lactic acid into the Weisberg et al process in order to increase the yield of the desired ethyl lactate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres can be reached on 571-272-0867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Taylor Victor Oh, MSD,LAC
Primary Examiner
Art Unit: 1625

/Taylor Victor Oh/
Primary Examiner, Art Unit 1625
9/09/08